

IR-1881 (2-2532)

**Title: SEMICONDUCTOR MULTICHIP MODULE PACKAGE WITH
IMPROVED THERMAL PERFORMANCE; REDUCED SIZE AND
IMPROVED MOISTURE RESISTANCE**

ABSTRACT OF THE DISCLOSURE

5 A multichip module has a substrate, which receives several flip chip and for
other semiconductor die on one surface and has vias extending through the substrate
from the flip chip bottom electrodes to solder ball electrodes on the bottom of the
substrate. Passive components are also mounted on the top of the substrate and are
connected to further vias which extend to respective ball contacts at the substrate
bottom. In one embodiment, the bottom surfaces and electrodes of the die are
insulated and their tops (and drain electrodes) are connected by a moldable
conductive layer. In another embodiment the top surface of the substrate is covered
10 by an insulation cap, which may be finned for improved thermal properties. The
passives are upended to have their longest dimension perpendicular to the substrate
surface and are between the fin valleys. The insulation cover is a cap which fits over
the top of the substrate, with mold lock depressions contained in the junction
between the cap peripheral interior edge and the substrate mating edge surfaces.